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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/476,633	12/31/99	WANG	L 042390.P7832

MMC1/0705  
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EXAMINER	
GARCIA, J	
ART UNIT	PAPER NUMBER

2823

DATE MAILED: 07/05/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
09/476,633

Applicant(s)

Wang et al

Examiner  
Joannie Adelle Garcia

Group Art Unit  
2823



☐ Responsive to communication(s) filed on \_\_\_\_\_

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claim

☒ Claim(s) 1-22 is/are pending in the applicat

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-22 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 14 and 19, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the amended filed 2-15-00, in claim 14, line 2, the period is missing after "metal".

In the amendment filed 2-15-00, in claim 19, line 3, it is unclear what is recited by "after a polishing of the substrate".

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

Claims 1-4, 6, 7, 9-11, 13-15, 18, and 20, are rejected under 35 U.S.C. 102(e) as being anticipated by Grumbine et al (U.S. Patent 6,068,787).

Grumbine et al teaches a removing a particle from a metal surface of a via by introducing a first agent to a metal layer, polishing the metal layer with first agent, and introducing a second agent comprising hydrogen peroxide. He also discloses that polishing the metal layer comprises

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polishing a metal material selected from the group consisting of tungsten, copper and aluminum. He also teaches that polishing the metal layer comprises polishing with the first agent having an abrasive material selected from the group consisting of silica, alumina, zirconia, and ceria. He discloses as well, that polishing comprises chemical mechanical polishing. He is also teaching that introducing the second agent comprises introducing a second agent of approximately 4% by volume or less of hydrogen peroxide. He also teaches polishing the substrate with the second agent. He also discloses depositing a slurry onto the substrate, polishing the metal layer and the substrate, and rinsing a metal plug with a solution comprising hydrogen peroxide. He is teaching as well, that polishing the metal layer includes removing the metal. (Column 2, lines 23-32, Column 3, lines 32-38, lines 47-56, and 61-67, Column 4, lines 48-53, Column 6, lines 43-46, and Column 10, lines 40-51)

Claims 5, 12, and 19, are rejected under 35 U.S.C. 103(a) as being unpatentable over Grumbine et al as applied to claims 1-4, 6, 7, 9-11, 13-15, 18, and 20 above, and further in view of the following comment.

Grumbine et al does not disclose sequential use of slurries with and without hydrogen peroxide. However, in view of the disclosure that both types of slurries are effective in polishing metals. It would have been within the scope of one of ordinary skill in the art to employ a slurry containing hydrogen peroxide subsequent to another slurry to achieve respective portions of the polishing step.

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Claims 8, 16, 17, 21, and 22, are rejected under 35 U.S.C. 103(a) as being unpatentable over Grumbine et al as applied to claim 1-4, 6, 7, 9-11, 13-15, 18, and 20 above, and further in view of Robinson et al (U.S. Patent 5,990,012), and the following comment.

Grumbine et al does not disclose that rinsing occurs during polishing, that polishing the metal layer with the second agent includes polishing with a polisher operating at a polishing pressure approximately in the range of 0.5 psi to 2.0 psi, and that the metal layer is removed at a rate of 60 Å/minute. Robinson et al discloses rinsing during a polishing operation (Column 1, lines 48-50). It would have been within the scope of one of ordinary skill in the art to employ the process of Robinson et al for it's disclosed intended purpose to achieve the metal layer polishing step of Grumbine et al. It would be a matter of routine optimization within the teachings of Grumbine to determine a suitable pressure and a suitable rate to achieve the metal layer polishing step and metal layer removal step.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. **See MPEP 203.08.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner J. Garcia whose telephone number is (703) 306-5733. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax number for this group is (703)308-7722(and 7724 and 7382). MPEP 502.01 contains instructions regarding procedures used in submitting responses by facsimile transmission.



JAG  
July 2, 2000



George Fourson  
Primary Examiner  
Art Unit 2823